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CIRCULATION ELEMENT
OF THE GENERAL PLAN
CITY OF GRIDLEY

SUPPORT DOCUMENT

prepared for

The City of Gridley

by

ECUMENE ASSOCIATES

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GRIDLEY CIRCULATION ELEMENT SUPPORT DOCUMENT

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CIRCULATION ELEMENT
OF THE GENERAL PLAN
CITY OF GRIDLEY

I. PURPOSE

The Circulation Element of the Gridley General Plan describes the existing movement of people and goods and seeks to provide for future conditions. The automobile, rail, bicycle, and pedestrian circulation systems treated are interdependent; planning for them is related to all other Gridley General Plan Elements.

It is the purpose of this Circulation Element to suggest ways to maximize the resources of the circulation system by responding to the development consequences of General Plan and zoning decisions. Hence, flexibility is built into statements concerning future conditions to provide a means for a continuing balance between the placement and movement of people and goods.

II. GOALS

Goal 1 - To coordinate elements of the city circulation system with county, state and federal transportation systems.

Policies:

- 1) Gridley supports the use of available funding through county, state and federal sources to finance regional transportation improvements.
- 2) To accommodate projected growth within Gridley on State Highway 99, plans for residential and industrial growth in Gridley will be coordinated with CalTrans planning staff.
- 3) Advance planning should consider widening the entire length of State Highway 99 to four lanes, except within the Gridley urban area, where a continuous left turn lane or possibly widening to six lanes may be necessary to accommodate anticipated traffic increases.

Goal 2 - To minimize circulation and transportation costs to the City while providing reasonable access to and from the City as well as to facilitate efficient internal movement.

Policies:

- 1) Development should not be permitted that will significantly increase traffic congestion, unless mitigating measures can be provided.
- 2) New development shall pay the cost of improvements necessary to maintain adequate service levels in areas affected by said development.
- 3) The existing arterial street system within Gridley will be preserved and maintained.
- 4) Circulation within the City will be facilitated by improving the capacity of existing arterials and, if needed, by the designation of new routes.
- 5) Unless off-site circulation facilities are financed by the developer, residential development will be channelled toward committed circulation and growth patterns so as to avoid substantial public investment in new collector streets or major arterials.
- 6) The structural adequacy, design and alignment of Little Avenue, East Gridley Highway and State Highway 99 north of Magnolia will be studied and

evaluated, preferably at the time of a development proposal for abutting lands. The major portion of the costs for both the study and improvements would be borne by the land developer(s).

Goal 3 - To provide a circulation system in and adjoining commercial areas which promotes safety and minimizes traffic congestion.

Policies:

- 1) Ingress and egress to shopping centers will be carefully designed with special emphasis toward promoting traffic safety. Left-hand turning movements into and out of commercial areas should be minimized, especially near intersections and where turning lanes are not present.
- 2) Prior to additions to commercial areas, the City Council will be satisfied that all applicable traffic engineering principles are considered and utilized to the fullest extent possible.
- 3) In no case should commercial development substantially increase traffic on the existing street system unless there is an implementable program to properly mitigate such traffic impacts.

4) Commercial strip development with its accompanying traffic congestion and cross traffic must be carefully analyzed for traffic safety and ease of traffic flow. Limited (shared) access configurations should be explored where possible.

Goal 4 - To provide a safe and practical circulation system.

Policies:

- 1) Sidewalks, paths and appropriate cross-walks should be located close to all schools and along all principal streets leading to schools and other areas with significant pedestrian traffic.
- 2) All street intersections shall be designed and maintained to assure adequate sight distance to and from approaching vehicles.
- 3) Private recreational and accessory vehicles should be parked off the public right-of-way and out of the front building setback in order to promote traffic safety and good visibility.

- 4) There should be emphasis on making streets safer for all users, including bicyclists, and pedestrians, through the use of all possible and practicable engineering improvements short of signalization.
- 5) A high level of traffic rules enforcement should be maintained in order to reduce injury to persons and damage to property.
- 6) Traffic from major new residential development should not be routed through residential neighborhoods. At least two access routes should be provided, and at least one of those should be through other than a residential neighborhood.
- 7) All new subdivision roads shall conform to City standards and be reviewed by City staff for road widths, vertical and horizontal curves, and sustained grades.
- 8) Alternate emergency access roads shall generally be required in developments greater than 40 units and shall be reviewed by the Fire Department.

- 10) New street names should not duplicate those street names already in use in the Gridley area.
- 11) Consistent with good traffic engineering practices, on-street parking in bike lanes shall be prohibited.
- 12) Private streets may be permitted when they are deemed to be in the public interest, constructed consistent with City street standards, and their maintenance is guaranteed.

Goal 5 - To provide circulation throughout the City so that it is the least disruptive to existing residential areas while assuring that all of the City has a level of access consistent with the need for public safety and general welfare.

Policies:

- 1) Access to developing subdivisions should not significantly alter the environment along existing collector streets.

Goal 6 - To provide a circulation system that utilizes a broad range of transportation modes.

Policies:

- 1) Alternate modes of transportation, including bus, bicycle and walking, should be encouraged to reduce demands upon the street system.
- 2) Bike lanes and walkways should be fully developed in order to broaden transportation options.
- 3) Adequate space for bus maneuvering, stopping and parking space shall be considered in conjunction with improvements to City roads with construction of new roads.

Goal 7 - To provide convenient parking spaces in the downtown area that are available and accessible to shoppers, employees and others as they are needed.

Policies:

- 1) A parking inventory will be conducted as needed in order to determine problem areas of parking demand.
- 2) Bicycle and pedestrian access to the downtown will be encouraged by providing bicycle racks and by insuring that all sidewalks and pedestrian routes are convenient and safe.

III. EXISTING CONDITIONS AND METHOD OF ANALYSIS

A. The Road System

The road system is functionally divided into arterial, collector, and local streets (Figure 1). Arterials link the major areas within the community with each other and carry traffic from the collector streets to the highways. Collectors carry traffic from minor streets in residential areas and carry local traffic to shopping centers, schools, arterials and highways. Local streets are minor streets connecting individual properties to the rest of the road network. Most of Gridley streets are of this type.

The major transportation corridors are State Highway 99 and the Southern Pacific Railroad. They extend north-south for slightly over one mile through the eastern and central portions of the city, respectively.

There is no freeway providing direct access to Gridley. State Highway 99 carries approximately 10,200 vehicles per day, drawing 60 percent of automobile and truck traffic from local and collector streets. This major arterial has been widened to four lanes with a continuous left turn lane between West Liberty Road and Magnolia Street. The 100-foot right-of-way relieves traffic congestion from the newly built Plaza Shopping Center fronting on Highway 99. North of Magnolia Street the arterial narrows to less than 80 feet due to the placement of buildings along the highway.

Other arterials significant to movement in and out of the city are the Colusa, Gridley-Biggs, and East Gridley Highways. These are two-lane roads with 45-55 mph speed limits. The East Gridley highway intersects State Highway 99 at Magnolia Street. The Colusa Highway and Gridley-Biggs Road intersect at right angles in the northwest portion of the city and feed into Sycamore Street, which terminates at State Highway 99.

Spruce street is designated an east-west arterial, reducing east-west traffic on Sycamore street which passes two schools. Sycamore Street is expected to remain a collector. The other two east-west collectors are Ord Ranch Road to the north, and Little Avenue to the South. North-south collectors are Block Road, Randolph Avenue, Oregon Street, Vermont Street and Washington Street. While not classified as a collector, Magnolia Street (one block south of Sycamore) provides major truck access to the cannery via Virginia. All other streets in Gridley's circulation system are shown as local streets, of lesser importance than collectors in volume of traffic and design capacity.

RIGHT-OF-WAY WIDTHS

BY STREET CLASSIFICATION

State Highway 99	100 feet
Arterial or Major Collector (4 lanes)	84 feet
Minor Collector or Local Street (2 lanes)	60 feet

B. The Transit System

The Southern Pacific Railroad bisects the city, running north-south between and parallel to Virginia and Washington Streets. Eight trains pass through the city in a 24-hour period, providing direct movement of goods to and from the Libby Cannery. Railroad crossings are at grade throughout the city.

The Gridley Golden Feather Flyer is a dial-a-ride bus service for the elderly and handicapped in Gridley and the surrounding area. The service is available seven days a week, 24 hours a day. The Intercity Transit System provides three buses and one backup bus per day between Biggs, Gridley, Palermo, Oroville, Durham, Chico and Paradise. The system is a cooperative effort between the County and the participating cities, designed to connect the major populated areas of Butte County. Three buses on three routes operate eleven hours each weekday. To supplement the intercity system, Greyhound issue tickets subsidized by the system. The Greyhound Bus depot is located in Gridley at Spruce and Ohio Streets.

C. Pedestrian and Bicycle System

The city has no provision for separate marked bicycle lanes on its roadways. There is sufficient right-of-way to allow for a safe, continuous bicycle lane on arterials such as Sycamore and collectors such as Spruce, Hazel, Magnolia, Virginia and Washington. Local, less heavily traveled streets such as Cedar, Laurel and Ohio likewise provide a reasonably

safe bicycling environment. However, parked cars along local streets can jeopardize safety by reducing the bicyclists' visual field and forcing encroachment of bicyclists into the automobile traffic lanes.

Pedestrian movement is provided for by crosswalks at street intersections and by sidewalks along most of the city's streets. Signalized intersections at State Highway 99 at Magnolia, Hazel and Spruce all have pedestrian-activated crossing buttons.

D. Parking in the Downtown Area

For purposes of a parking inventory, "downtown" area was defined as that area encompassed by Spruce Street on the north, Jackson Street on the east, and Sycamore Street and Vermont Streets on the south and west, respectively. The total number of street parking spaces within this area is 449. The parking lot at Washington Street and Sycamore Street has a total of 62 parking spaces but it is a private lot.

Downtown parking conditions are favorable throughout the day, except for the heavily used areas on Hazel between Kentucky and Virginia and on Virginia between Hazel and Sycamore. Observation of weekday parking availability showed 12:00 noon to 2 PM and 4 to 5 PM as the heaviest occupancy periods for downtown parking. During these periods there is a maximum estimated 60 percent occupancy, meaning that there are several available spaces in a small area, and parking is generally available within

one block (or less) of where the driver prefers to park (nearest the business destination).

These parking areas serve small businesses in the downtown. Due to the general ease of parking, there is understandably a high expectation of parking availability directly in front of or very close to the business destination.

If parking requires a walk of more than one block, a parking shortage may be perceived, although no parking shortfall exists. However, with revitalization of the downtown businesses, and general growth in the area, this may become a problem.

E. Method of Analysis

The dimensions, design and signalization of streets and intersections determine their ultimate capacity. Every approach to an intersection can only accommodate a certain maximum number of vehicles before traffic flows become unacceptably slow and congestion occurs. Roadway design and traffic control devices must be monitored and occasionally adjusted in anticipation of changes in traffic patterns and volumes.

Whenever possible, changes to roadways should be planned and implemented prior to the time that an intersection approach reaches capacity. "Capacity" is the maximum number of vehicles possible given a roadway's particular geometry, traffic conditions and controls. It is desirable that every

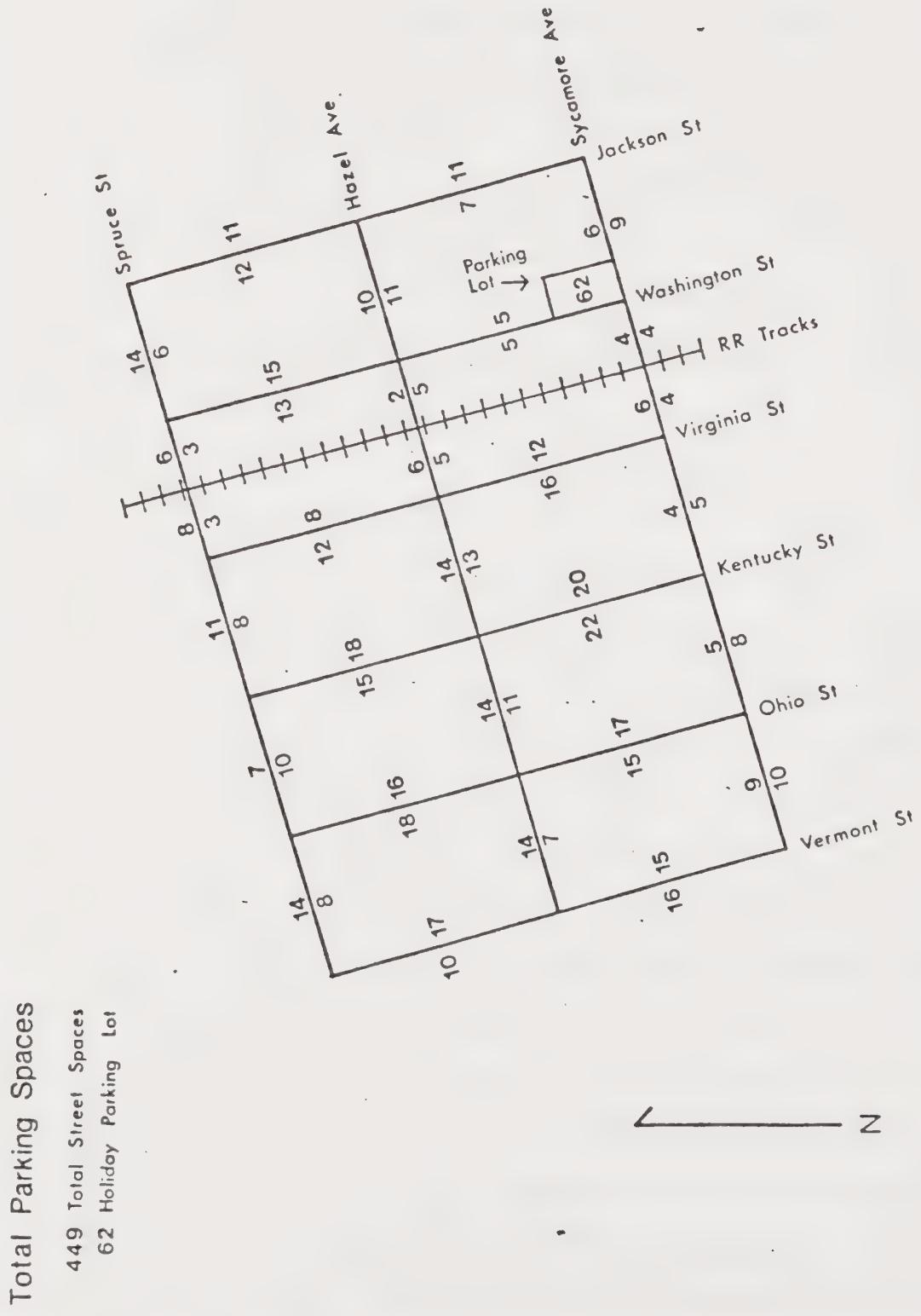


Figure 2: Downtown Parking Diagram

approach to each intersection operate at stable conditions (vehicles occasionally wait through more than one red light) or free-flowing conditions (no vehicle waits longer than one red light). Once a roadway has reached its design volume, substantial approach delays are likely.

Intersection approaches are generally the limiting factor for capacity of roadways. The term "level of service" is used to describe the traffic flow condition of roadway links or intersections; these levels are categorized to reflect degrees of driver satisfaction. When an approach to an intersection is functioning at an acceptable level (traffic is flowing freely or is stable), the level of service is expressed as A or B. Level of service C is a stressed but generally acceptable level. If traffic flow on approaches to intersections is deteriorating, level of service is expressed as D, E or F, indicating that modifications to the street are needed to improve traffic flow (see Table 1, Level of Service Table).

To determine present level of service in Gridley, traffic counts were taken to identify the most heavily travelled approaches to all intersections. Most intersections in Gridley are nonsignalized, with minor street yield signs (no stop signs), two-way or four-way stops. Two-way stops control the majority of nonsignalized intersections.

TABLE 1
SUMMARY OF LEVELS OF SERVICE FOR INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability
A	Free flow	No vehicle waits longer than one red indication.	Turning movements are easily made, and nearly all drivers find freedom of operation.
B	Stable flow	The number of vehicles waiting through one red indication is increased.	Many drivers begin to feel somewhat restricted within groups of vehicles.
C (Design Level)	Stable flow	Occasionally vehicles may have to wait through more than one red indication.	Backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.
D	Approaching unstable flow	Delays may be substantial during short periods, but excessive backups do not occur.	Maneuverability is severely limited during short periods due to temporary backups.
E (Capacity)	Unstable flow	Delay may be great--up to several signal cycles.	There are typically long queues of vehicles waiting upstream of the intersection.
F	Forced flow	Excessive delay.	Jammed conditions. Backups from other locations may restrict or prevent movement of vehicles at the intersection under consideration.

Source: Highway Capacity Manual, 1965.

1. Signalized Intersections

For the signalized intersections, opposing motions were studied: left turns and through motions for north-south and east-west travelling traffic were counted during morning, noon and afternoon peak hours. The most critical leg of each intersection was identified. Level of service criteria were used to define conditions for each intersection approach.

2. Nonsignalized Intersections

For nonsignalized intersections queueing theory was used. At four-way stops all approaches operate equally. Vehicle(s) may cross the intersection from alternating directions (E/W vs. N/S) at minimum intervals of five to seven seconds. The level of service determination is simply based on peak hour counts. For two-way stops and intersections without stop signs, capacity determination requires analysis of several variables: For each intersection, through motions, left and right turns are examined. The "critical gap," or the time required for a movement to be negotiated, is established. Left turns through an intersection from a minor street onto a through street are the most time consuming turns to complete at a two-way stop or nonsigned intersection. Because of the difficulty in completing this motion, the critical gap is longest and the approach capacity is lowest in terms of the hourly volume of traffic it is able to handle.

In every case, capacity is determined by examining roadway design and critical gaps for each approach. The left turn motion that is handling the greatest volume of traffic during a one-hour period will result in the lowest level of service recorded. This is the case for the left turn motion from Virginia onto Sycamore.

At many intersections in Gridley there is room for unshared right turn motions, and right-turning traffic flows freely. However, there are few unshared left turn motions (separate left turn lanes) that serve to implement traffic flow. Therefore, left turns at two-way and nonsigned intersections determine capacity over most of the city.

Most Gridley streets are presently operating with free-flowing, optimum traffic conditions (level of service A). The intersection of Sycamore and Virginia has the only approach in the city operating at level of service B. Approaches at Vermont and Sycamore, and Washington and Sycamore are operating at level of service A/B.

IV. FUTURE CONDITIONS

In order to anticipate problems and predict future circulation needs in Gridley, estimates of future residential, commercial and industrial growth in the city must be made. Planned growth in Gridley has been detailed in three reports written for the city concerning proposed rezoning. Figure 3 shows planned and predicted growth areas.

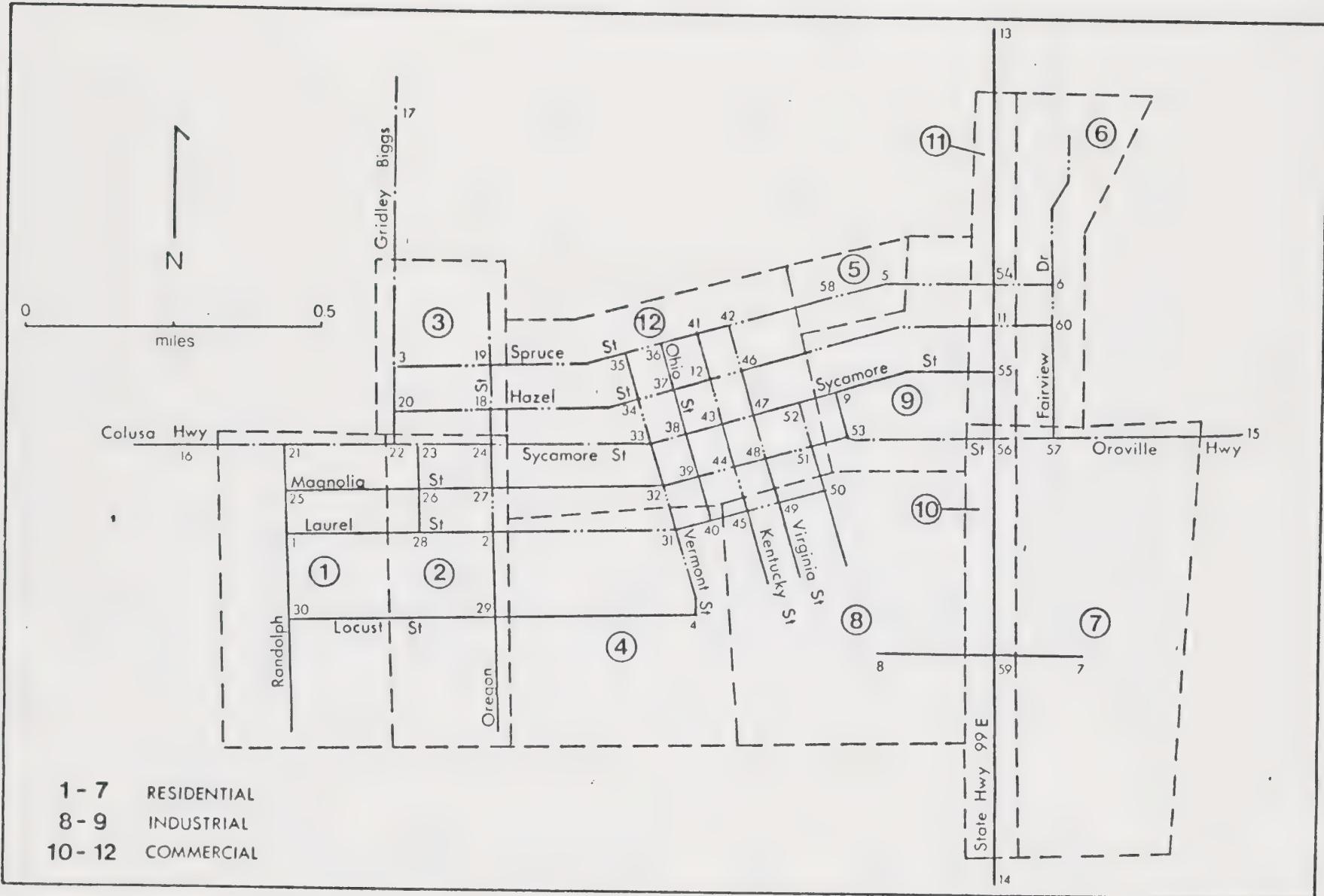


Figure 3: Network Capacity Diagram Designating Residential, Industrial and Commercial Growth Sectors

Trip generation for future development in the City of Gridley was estimated from data in several environmental impact reports and from overall growth trends in the mid-Sacramento Valley. For purposes of assigning trip beginnings and ends the city was divided into twelve zones. Each zone represented an area for potential new growth and development of an established residential, commercial or industrial area. Table 2 lists projected traffic volumes at ultimate build-out of residential, commercial and industrial sectors, as well as estimates of total trip generation for each sector. Using a computer network traffic simulation model new trips were assigned to local streets based on their probable origins and destinations. Streets included in the network analysis were: State Highway 99, Magnolia/East-Gridley Highway, Sycamore, Hazel, Spruce, Fairview Drive, Virginia, Washington, Kentucky, Ohio, Vermont, Gridley-Biggs Road, Oregon, Laurel, Randolph and Jackson.

The computer assigned maximum design traffic volumes on roadways for each approach to each intersection. Where necessary, traffic was routed along new paths when absolute capacities were exceeded. Whenever a particular street segment showed levels approaching a critical level (approaching maximum design capacity), traveling times were increased to reflect conditions under increased congestion. With each reevaluation in travel time, traffic was redistributed along minimum distance routes. Then each link and intersection

TABLE 2

Projected Trips: Ingress and Egress
 for Residential, Industrial and Commercial
 Growth Areas

<u>Residential Sectors</u>	<u>Percent Ingress</u>	<u>Percent Egress</u>
Sector 1	69	23
2	64	22
3	139	46
4	120	40
5	122	41
6	103	34
7	314	105
<u>Industrial Sectors</u>		
8	305	916
9	65	196
<u>Commercial Sectors</u>		
10	450	400
11	450	400
12	150	150

Assumption: For 4:30-5:30 peak hour trips, the ratio of ingress to egress is as follows:

	<u>Percent Ingress</u>	<u>Percent Egress</u>
Residential	75%	23%
Industrial	25%	75%
Commercial	50%	50%

Sources:

- 1) Draft EIR for the Industrial Zoning Districts of Gridley, California, December, 1979.
- 2) Draft EIR for the Commercial Zoning Districts of Gridley, California, September, 1978.
- 3) Draft EIR for the Residential Zoning Districts of Gridley, California, March, 1979.
- 4) CalTrans Trip Generation Manual
- 5) Estimates of Commercial Acreage

affected was evaluated for potential impact as reflected in increased haul times or reductions in levels of service.

Figure 4 shows future levels of service for intersection approaches at level C or worse.

Areas identified as having potential for future traffic congestion problems are: Highway 99, Jackson Street, Magnolia Street, and Washington Street. (Refer to Figure 4 for future levels of service diagram.)

Highway 99 south of Hazel will continue to receive large increases in local as well as regional traffic. Most of this increase will be due to new industrial development in the southern portion of the city and to increased density of commercial land uses along the highway. Even with the construction of an additional lane sometime in the next 10 years, the highway is expected to operate at level of service E in the northbound direction during afternoon peak traffic hours.

Jackson, Magnolia and Washington Streets will experience increased use and eventual stress as the demand for alternate north-south routes through the city increases. At full development Magnolia at Jackson and Washington will operate at level of service D or below.

The western portion of the city will experience greater than average traffic increases over the next few years.

Suggested changes to alleviate the effects of these growth patterns are listed in the Circulation Element Summary Document.

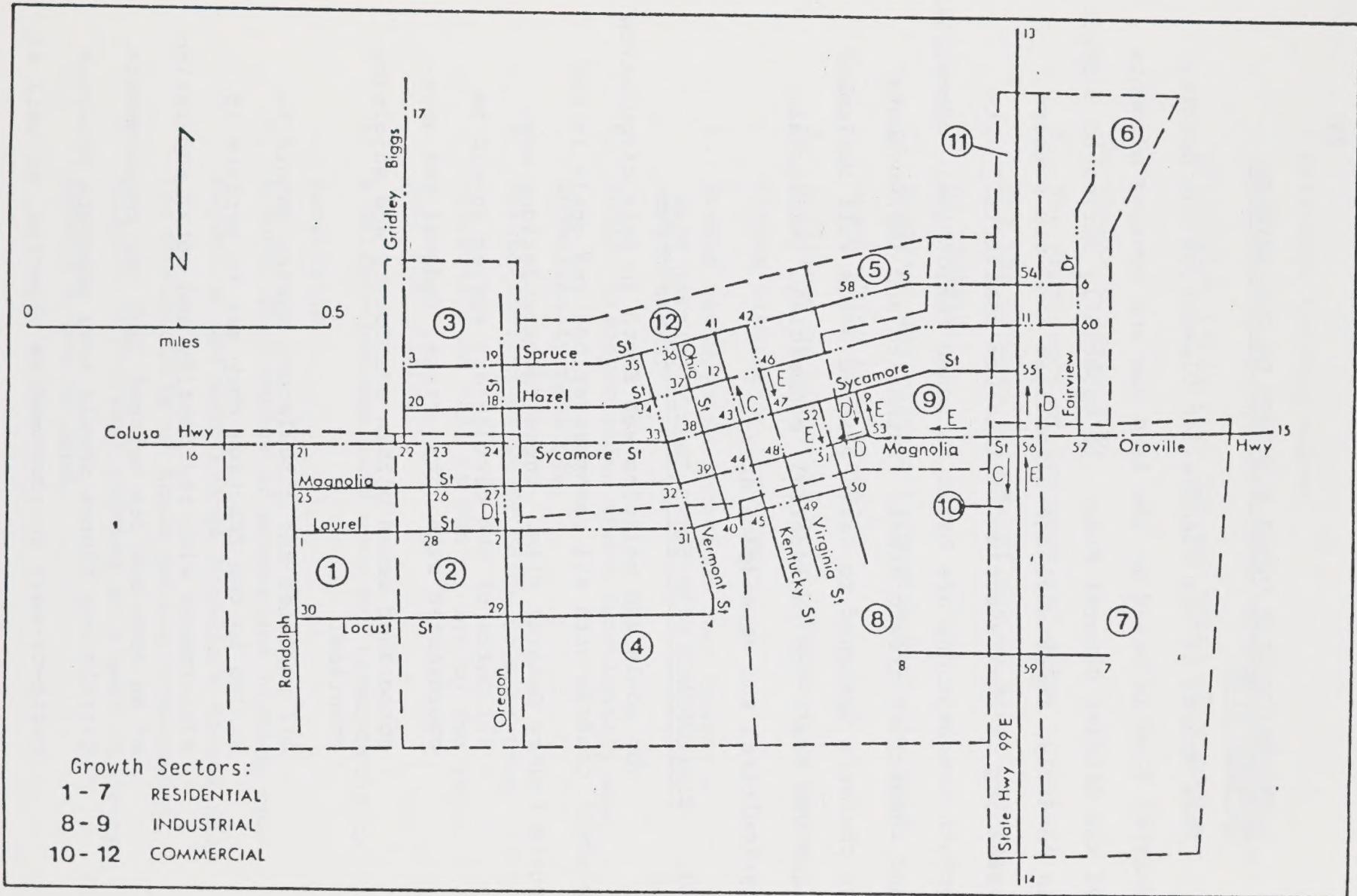


Figure 4. Network Capacity Diagram Showing Future Levels of Service at Intersections (assuming ultimate buildout of all growth sectors)

V. CONFORMANCE WITH OTHER ELEMENTS OF THE GRIDLEY GENERAL PLAN

This update of the Circulation Element of the Gridley General Plan is based on the land use and housing elements of the Gridley General Plan. It especially serves to support an "orderly, functional and compatible land use pattern resulting in the reduction of land use conflicts." Its growth presumptions are based on zoned residential, commercial and industrial growth areas. Extension and improvements to roadways designed to serve planned needs will implement Land Use Goals for residential, commercial, industrial, agricultural and open-space areas.

VI. CONFORMANCE WITH BUTTE COUNTY GENERAL PLAN

The goals and policies set forth in this circulation element conform with all recommendations and goals in the Butte County General Plan. These recommendations are:

- All parts of the circulatory system should be coordinated with city, state, federal and unincorporated areas within the County and adjoining counties.
- All parts of the circulatory system should be scaled to the function they are to perform in conformance with the density and total population of an area and its related land use requirements.
- Circulatory routes should have adequate reserved right-of-ways to accommodate expected, as well as

existing, traffic volume.

- The circulatory system should provide balance and integrated facilities for all modes of travel.

The County's Goals are:

1. The provisions of freeways and prime arterials for the primary purpose of moving large volumes of traffic.
2. Freeways designed to harmonize with the landscape which they traverse.
3. Avoidance of bisecting neighborhoods and communities with major highways.
4. Scenic highways in locations that traverse scenic areas.
5. Public transportation where functionally and economically feasible.
6. Beautification of major roads to make them attractive as well as convenient to the resident and visitor.
7. A balance between land uses and transportation facilities.
8. A continuing review of street and highway construction and maintenance standards to maximize the economic life of these public investments.
9. Adequate off-street parking as a part of every intensive use of land.

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